

PUBLIC HEALTH REPORTS

VOL. 51

OCTOBER 30, 1936

NO. 44

MORTALITY FROM CERTAIN CAUSES DURING THE FIRST HALF OF 1936¹

This report presents mortality data for 21 States, the District of Columbia, and Hawaii for the first half of 1936, with comparative data for recent years. In addition to the death rate from all causes, rates are shown for 17 specific causes, 4 groups of causes, and for infant and maternal mortality.

The rates are computed from current and generally preliminary reports furnished by State departments of health. Because of some lack of uniformity in the method of classifying deaths according to cause, some delayed death certificates, and various other reasons, these preliminary rates cannot be expected to agree in all instances with final rates published by the Bureau of the Census. The final figures are based on a complete review and retabulation of the individual death certificates from each State. The preliminary rates given in the accompanying table are intended to serve as a current index of mortality until final figures are available.

The populations used for 1934 and 1935 are the official estimates as published by the United States Bureau of the Census on May 11, 1936. These estimates are corrected to agree with the population of the United States as computed from births, deaths, immigration, and emigration since the 1930 census. Since no estimates have been prepared for States for 1936, the figures used are an extrapolation from the official 1935 estimates, with the same annual increment as that used by the Bureau of the Census for the year 1935 as compared with 1934. Populations for 1933 were estimated by making the increment for 1934 over 1933 the same as that used by the Census Bureau for 1935 as compared with 1934.

At the top of the table, rates are given for a group of 22² States with an estimated population of 70,000,000 that have data available for the first 6 months of each of the 4 years 1933-36. For individual States, data are shown for the first 6 months or for as many of those months as are now available, with rates for corresponding periods of 2 preceding years. Comparisons made below refer only to the 22 States with complete data.

¹ From the Office of Statistical Investigations, U. S. Public Health Service.

² See footnote to table for States included.

The death rate from all causes for the first half of 1936 was 11.9 per 1,000 (annual basis), as compared with 11.4, 11.5, and 11.1 in the first 6 months of 1935, 1934, and 1933, respectively. In 19 of the 22 States the rate was higher in the first half of 1936 than in the same half of 1935. In both the first and second quarters of 1936 the rates exceeded those for the corresponding periods in the 3 preceding years.

The relatively high mortality from all causes is largely accounted for by the increased mortality from influenza and pneumonia during the first half of 1936. Mortality from influenza and pneumonia was slightly higher in the first half of 1936 than in the same period of 1935 and 1933, and markedly higher than in 1934, a year of low influenza and pneumonia mortality. Rates for pneumonia were higher in both the first and second quarters of 1936 than they were in corresponding periods of the 3 years immediately preceding; 18 of the 22 States showed an increase over the first half of last year and 4 a decrease. Mortality from influenza was higher in the first half of 1936 than in either 1935 or 1934 for the same period; only 8 of the 22 States, however, reported higher rates than in the same period of 1935. During the first quarter of 1936 reported mortality from influenza was lower than last year, and during the second quarter it was higher than in any of the 3 preceding years. The minor epidemic of influenza³ in the winter of 1935-36 was most severe in the southwestern section of the country and extended over a period of approximately 4 months, from January to April, inclusive.

Infant mortality in this period was the lowest it has been in recent years. Among 22 States with complete data, 19 had lower rates and 3 had higher rates in the first half of 1936 than in the same months of 1935.

The mortality rate from meningitis was definitely higher during the first 6 months of 1936 than during the corresponding period in each of the 3 preceding years; 15 of the 22 States had a higher rate than in 1935. The incidence of meningitis has stood at a relatively high level since the latter part of 1934. States showing the greatest increases in 1936 over 1935 in the death rate were those located in regions along the Atlantic coast and the South Central region. Scarlet fever was exceptionally high during 1935 and in the early part of 1936; the rate for the first 6 months of each year was 3.1 per 100,000 as compared with 2.8 for the corresponding period in the years 1934 and 1933.

Heart diseases, nephritis, cerebral hemorrhage, cancer, and diabetes showed increases over recent years. The rise was particularly significant in heart diseases, which showed an increase of about 9 percent

³ See Gover, Mary: Influenza Mortality in the United States, 1936. Public Health Reports, Oct. 9, 1936, p. 1399.

over the 1935 rate, as compared with less than 1 percent in 1935 over 1934; the increase for this period in 1934 over 1933 was approximately 10 percent. The 1936 rise was quite general; 20 of the 22 States having a higher rate and only 2 showing a decrease. Nineteen States reported an increase in cerebral hemorrhage and diabetes and 14 an increase in cancer.

The death rates from measles and whooping cough were considerably below those for the 3 preceding years. In 1935 and 1934 both of these diseases were unusually prevalent. The typhoid rate (0.9 per 100,000) was the lowest for this period in the 4 years under review. The diarrhea and enteritis rate was also the lowest in recent years. Diphtheria continued to decline, with a rate of 1.7 per 100,000, as compared with 1.9 for the corresponding period in each of the 3 preceding years.

The steady decline of tuberculosis was uninterrupted; 17 of the States participated in the decline from the 1935 level and 5 showed an increase.

Mortality from certain causes in the first 6 months of 1936, with comparative data for the corresponding period in preceding years

State and period	Rate per 1,000 live births			Death rate per 100,000 population (annual basis)																						
	All causes, rate per 1,000 popu- lation (annual basis)	Total infant mortality	All except malforma- tions and early infancy	Maternal mortality	Typhoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Lethargic encephalitis (17)	Meningococcus menin- gitis (18)	Tuberculosis, all forms (23-32)	Cancer, all forms (45-63)	Diabetes (59)	Diseases of the nerv- ous system (78-89)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the circula- tory system (90-103)	Diseases of the heart (90-95)	Diseases of the respi- ratory system (104- 114)	Pneumonia, all forms (107-109)	Diseases of the diges- tive system (115-129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130-132)	
22 STATES ¹																										
January to June—																										
1936.....	11.9	55	24	5.6	0.9	1.0	3.1	2.0	1.7	29.6	0.2	0.6	3.2	53.8	114.3	27.9	113.0	91.9	310.5	293.9	128.6	115.1	63.3	5.3	88.3	
1935.....	11.4	58	26	5.8	1.0	5.3	3.1	4.4	1.9	28.9	.2	.7	2.7	55.0	112.0	25.3	108.3	86.2	293.0	297.6	119.4	105.5	65.3	6.0	85.4	
1934.....	11.5	61	27	6.1	1.3	6.6	2.8	4.5	1.9	19.7	.4	.6	1.0	56.1	106.9	25.9	104.1	81.1	298.3	295.8	115.9	101.4	66.9	7.1	90.3	
1933.....	11.1	60	27	6.1	1.4	2.6	2.8	2.7	1.9	37.6	.3	.7	1.4	59.1	105.6	24.8	105.3	81.1	272.3	299.2	99.1	86.3	65.0	7.2	87.8	
January to March—																										
1936.....	12.6	58	27	5.8	.8	.9	3.5	2.0	2.2	36.6	.2	.6	3.4	53.8	113.8	30.3	119.3	97.2	338.5	311.7	158.5	142.9	62.2	4.9	92.6	
1935.....	11.9	63	31	6.0	.9	4.6	3.2	3.9	2.4	43.9	.2	.6	2.3	94.7	106.6	27.0	111.3	89.7	300.4	279.8	141.4	127.2	63.1	4.3	88.0	
1934.....	11.9	64	30	6.0	.9	5.7	3.3	4.1	2.5	27.1	.3	.6	1.9	55.5	107.9	27.3	108.8	84.5	316.0	281.1	137.0	121.6	63.9	3.8	94.2	
1933.....	11.8	66	32	6.3	1.2	1.9	3.2	2.7	2.5	62.8	.3	.7	1.6	59.0	105.4	26.9	110.3	85.6	288.5	283.6	125.6	111.8	61.6	3.6	90.5	
April to June—																										
1936.....	11.3	53	21	5.3	1.0	1.1	2.7	1.9	1.2	22.6	.1	.6	2.9	53.8	114.7	25.6	106.8	80.6	300.5	276.0	98.7	87.3	64.3	5.7	84.0	
1935.....	10.9	54	22	5.5	1.2	6.1	3.0	5.0	1.4	14.0	.2	.7	2.9	55.1	114.4	23.6	105.3	82.9	278.9	255.3	97.7	83.8	67.4	7.6	82.8	
1934.....	11.1	59	22	6.2	1.7	7.5	2.3	5.2	1.4	12.3	.4	.6	1.0	56.8	111.9	24.4	93.5	77.7	280.7	250.7	95.0	81.4	69.9	8.3	86.5	
1933.....	10.4	54	27	5.8	1.6	3.2	2.5	2.7	1.3	12.1	.3	.7	1.2	59.2	105.9	22.7	100.2	76.7	256.2	224.7	72.9	61.0	60.1	9.1	85.1	
JANUARY TO JUNE																										
Alabama:																										
1936.....	11.6	71	45	6.5	.8	1.2	.5	2.6	2.7	82.2	.4	.1	1.1	68.2	56.1	12.6	96.7	69.3	167.4	132.2	146.9	139.1	59.7	13.2	82.4	
California:																										
1936.....	14.6	51	23	5.1	.3	5.3	2.9	1.1	2.9	29.4	.3	.6	3.3	89.6	151.8	29.5	128.0	101.9	448.8	406.1	128.5	113.1	83.1	4.8	98.6	
1935.....	13.8	54	25	5.1	1.1	9.9	1.5	.6	2.3	18.5	.4	.3	2.1	82.1	147.9	30.5	126.4	94.9	428.5	376.5	111.2	97.6	84.3	4.4	96.3	
1934.....	12.3	53	24	4.6	.9	3.0	1.7	3.4	2.0	10.8	.5	.7	1.3	93.8	136.9	26.0	117.8	90.0	381.7	338.2	105.6	91.3	70.8	6.5	92.9	
Connecticut:																										
1936.....	10.9	47	(1)	4.9	.1	.7	.8	2.1	.2	13.4	.1	.3	1.3	40.6	128.7	32.0	(1)	(1)	(1)	247.1	(1)	99.6	(1)	2.9	96.4	
1935.....	11.0	47	(1)	5.6	.7	3.4	2.0	1.3	.9	12.3	.2	.4	1.7	47.3	124.3	34.8	(1)	(1)	(1)	233.6	(1)	90.3	(1)	1.5	93.0	
1934.....	10.7	55	(1)	5.6	.5	.2	.9	1.2	.4	9.9	(1)	.4	1.7	45.6	118.9	27.9	(1)	(1)	(1)	234.3	(1)	86.4	(1)	3.8	92.5	

District of Columbia:		15.5	72	32	5.6	1.9	2.2	6	5.4	6.4	12.8	3	14.4	112.7	134.2	33.0	146.3	109.5	413.1	365.4	193.4	174.8	76.5	5.8	101.2	
1936	1935	15.3	62	29	4.9	1.4	(1)	2.7	3.3	3.7	18.0	(1)	1.4	113.7	129.0	28.5	128.7	101.2	406.4	359.2	188.8	171.4	91.0	9.2	106.6	
1934	1933	15.5	68	38	3.1	1.4	17.3	1.8	10.4	1.1	9.7	4	1.1	115.2	131.8	33.5	133.6	100.8	433.2	381.0	164.6	145.1	85.7	9.0	119.2	
Florida:																										
1936	1935	13.3	64	33	8.2	2.4	4	1	1.7	2.8	79.4	7	3.3	54.1	87.9	21.7	133.9	106.9	279.2	257.7	121.5	105.3	83.5	8.2	110.1	
1934	1933	12.6	69	40	9.1	2.2	3.4	(1)	3.9	3.9	58.7	7	(1)	56.7	85.3	22.4	123.2	97.6	248.9	228.3	95.7	80.7	93.3	16.1	110.2	
1936	1935	12.8	70	37	8.0	3.1	9.5	4	5.6	3.6	30.3	5	5	61.7	81.1	17.0	129.9	98.4	254.2	234.8	103.9	90.0	94.1	14.2	124.1	
Georgia:																										
1936	1935	10.6	70	(1)	7.5	2.6	2	3	1.8	2.2	86.5	3	4	49.6	47.6	10.0	97.3	71.7	168.0	158.1	145.7	135.6	54.9	8.7	92.7	
1934	1933	9.9	75	(1)	8.0	3.3	1.3	6	6.1	2.6	60.6	3	1	50.8	46.2	10.8	94.6	63.5	151.8	142.3	112.2	103.5	67.3	14.3	93.2	
1936	1935	10.6	88	(1)	8.2	5.0	28.9	4	10.7	3.7	39.3	5	2	53.4	47.9	11.5	100.9	66.2	160.7	147.6	124.1	114.3	66.0	15.3	93.0	
Hawaii:																										
1936	1935	8.0	74	44	5.0	2.3	(1)	(1)	9	1.8	15.2	(1)	9	76.4	60.3	13.3	63.0	44.6	136.7	127.9	87.0	73.6	69.0	21.2	69.5	
1934	1933	8.1	89	42	5.4	2.4	(1)	(1)	3.3	7.6	(1)	5	(1)	75.4	63.6	15.2	61.2	46.5	120.0	111.5	83.0	72.1	68.8	24.2	70.7	
1936	1935	9.4	89	60	6.6	3.9	5	(1)	16.5	1.0	20.9	5	(1)	1.5	83.1	92.2	18.0	56.4	36.9	112.2	100.1	176.9	159.9	83.1	33.0	60.3
Idaho:																										
1936	1935	10.9	47	17	3.5	1.2	2.5	15.3	1.7	8	21.1	4	8	26.0	77.5	17.0	111.1	76.3	243.0	193.6	148.9	130.2	56.4	4	23.6	
1934	1933	10.2	61	25	7.3	1.3	2.5	4.6	10.1	4	23.6	4	2.9	51.1	23.7	66.9	13.5	91.8	68.2	210.9	162.5	132.6	115.8	60.6	8	29.0
1936	1935	10.2	50	17	5.5	2.6	6.0	3.4	3.0	3.0	18.3	1.7	1.3	34.1	69.9	10.7	107.9	78.4	199.1	169.3	135.1	121.1	61.0	2.6	38.8	
Illinois:																										
1936	1935	12.2	51	20	4.6	5	2	4.9	2.3	2.8	19.7	1	4	34.0	131.2	30.9	103.1	84.4	356.2	331.0	114.1	100.5	67.7	3.8	109.2	
1934	1933	11.5	64	22	5.5	7	7.3	7.8	3.4	2.8	24.9	2	6	34.8	126.7	25.5	100.0	75.3	310.5	288.6	109.3	98.2	69.7	3.0	101.6	
1936	1935	11.5	54	21	5.3	9	4.3	5.0	3.4	1.5	13.2	2	5	2.1	54.9	124.4	30.1	103.4	74.3	308.0	285.4	102.2	91.1	4.7	101.6	
Indiana:																										
1936	1935	12.4	55	23	5.4	8	2	4.5	1.7	3.7	42.8	1	7	2.4	49.9	108.7	18.1	(1)	135.9	(1)	281.5	(1)	132.1	(1)	3.7	83.8
1934	1933	11.5	59	26	5.8	5	4.8	4.4	5.5	2.6	37.1	1	6	3.7	50.0	110.5	14.7	(1)	129.3	(1)	264.8	(1)	108.0	(1)	3.1	68.7
1936	1935	12.0	57	25	6.3	1.8	11.2	4.3	5.3	2.7	23.1	3	4	8	53.0	108.1	18.7	(1)	122.9	(1)	266.8	(1)	94.5	(1)	3.8	79.5
Iowa:																										
1936	1935	10.9	52	19	5.8	1.3	3	6.2	2.1	1.9	28.6	(1)	(1)	3.5	22.9	124.1	29.4	147.2	299.1	267.2	123.6	113.2	87.9	2.7	74.5	
1934	1933	10.9	62	32	4.8	1.1	15.8	2.7	1.4	2.6	45.4	(1)	5	1.1	20.5	115.8	25.4	154.1	122.0	254.2	222.2	137.9	53.7	2.9	60.3	
1936	1935	10.8	59	25	6.9	3	1.0	2.4	2.9	1.6	38.9	(1)	8	1.1	20.5	115.8	25.4	154.1	122.0	254.2	222.2	137.9	53.7	2.9	54.6	
Kansas:																										
1936	1935	12.6	56	25	6.9	1.2	2	6.7	1.4	2.6	76.9	3	1.2	33.5	114.1	23.6	141.4	115.3	294.5	263.5	131.3	120.9	68.0	4.1	108.9	
1934	1933	11.7	66	28	5.5	4	23.1	5.1	3.6	2.1	51.4	2	1.5	29.0	103.3	112.1	22.5	123.9	307.6	259.2	129.2	117.4	69.6	4.8	94.0	
1936	1935	10.7	50	20	6.3	7	3.3	2.7	7.0	2.1	26.9	1	1.4	1.5	29.4	108.3	26.2	121.3	96.4	245.1	217.2	83.8	75.9	73.1	4.2	100.8
Louisiana:																										
1936	1935	12.7	87	61	11.2	4.5	3.8	3	5.8	3.7	77.8	4	2	74.6	77.9	18.0	99.6	74.8	245.4	215.2	165.5	150.8	76.4	17.8	111.6	
1934	1933	11.2	77	42	7.7	7.4	10.2	7	3.2	4.7	34.1	7	2	78.8	75.3	13.1	83.5	69.2	206.8	181.2	109.7	97.5	82.2	16.3	108.7	
1936	1935	10.7	78	40	9.8	8.3	11.4	1.1	12.3	4.8	27.4	5	2	73.2	74.5	13.5	85.0	57.6	218.4	197.7	96.7	83.4	71.8	21.1	106.4	
Maryland:																										
1936	1935	13.9	63	32	4.8	1.0	2.4	1	4.0	1.8	15.4	(1)	1.0	11.8	82.7	129.3	29.8	143.6	119.2	353.9	326.3	157.0	143.5	58.0	4.2	155.4
1934	1933	13.6	64	30	5.4	1.1	2.2	2.3	3.9	1.2	25.1	4	1.1	5.0	86.9	130.0	27.7	143.9	119.1	323.3	296.9	151.8	139.1	67.5	8.0	142.3
1936	1935	13.3	69	32	6.0	1.7	16.1	2.3	9.5	1.2	11.3	(1)	8	81.7	124.8	25.6	135.6	108.8	319.6	291.1	145.3	130.8	57.5	6.8	153.6	

States included are Connecticut, District of Columbia, Georgia, Idaho, Illinois, Indiana, Kansas, Louisiana, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, Pennsylvania, Rhode Island, South Dakota, Tennessee, Virginia, West Virginia, and Wisconsin (estimated population as of July 1, 1936, 70,188,000). Includes all of the States with available data for the 4 years covered by this summary. For a few cases, 1 to 3 deaths.

1 January to March only.

3 No deaths.

4 Data not available.

¹ States included are Connecticut, District of Columbia, Georgia, Idaho, Illinois, Indiana, Kansas, Louisiana, Maryland, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Virginia, West Virginia, and Wisconsin (estimated population as of July 1, 1936, 70,188,000). Includes all of the States with available data for the 4 years covered by this summary. For a few causes, 1 to 3 States were omitted because of missing data.

² Data not available.

³ No deaths.

⁴ January to March only.

Mortality from certain causes in the first 6 months of 1936, with comparative data for the corresponding period in preceding years—Continued

State and period	Rate per 1,000 live births										Death rate per 100,000 population (annual basis)																		
	All except infant mortality			Maternal mortality			Typhoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Polymyositis (16)	Lethargic encephalitis (17)	Meningococcus meningitis (18)	Tuberculosis, all forms (23-32)	Cancer, all forms (45-53)	Diabetes (59)	Diseases of the nervous system (78-89)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the circulatory system (90-103)	Diseases of the heart (90-95)	Diseases of the respiratory system (104-114)	Pneumonia, all forms (107-109)	Diseases of the digestive system (115-129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130-132)		
	Total infant mortality	All except infant mortality	Maternal mortality																										
JANUARY TO JUNE—CON.																													
Michigan:																													
1936.....	54	24	5.2	9	3	3.2	2.5	7	18.1	.3	.6	1.6	45.1	116.3	28.4	128.0	101.3	335.1	304.8	132.8	118.2	72.5	6.4	71.9					
1935.....	57	22	5.4	9	7.5	3.0	3.0	.9	23.9	(2)	.3	1.1	47.2	113.5	27.5	124.4	95.4	307.4	280.7	123.7	103.3	70.3	4.4	68.6					
1934.....	56	22	5.8	9	1.1	6.2	3.7	1.1	18.0	(3)	.2	.7	50.1	110.4	25.7	129.8	99.3	302.7	275.1	116.0	100.9	73.3	5.4	70.2					
Minnesota:																													
1936.....	45	16	4.7	5	1.6	7.4	1.0	3	18.1	.2	.6	2.6	37.7	129.0	27.3	115.5	84.6	269.2	250.7	113.4	100.7	60.7	4.0	40.8					
1935.....	40	20	5.6	6	4.1	4.8	3.4	5.5	24.3	.1	1.0	2.1	36.8	130.2	23.5	107.9	85.6	243.3	219.2	108.9	97.8	64.9	3.1	50.1					
1934.....	49	18	5.9	8	2.5	1.5	4.5	1.0	20.4	.3	1.4	1.0	39.2	129.8	24.0	107.4	84.5	252.0	227.2	110.5	96.2	69.4	2.7	56.0					
Mississippi:																													
1936.....	(4)	(4)	(6)	2.9	2.1	2.2	2.8	1.8	11.6	.4	.2	1.5	61.0	59.7	11.6	93.5	75.0	157.4	140.9	112.0	104.6	66.1	15.4	103.4					
1935.....	(4)	(4)	(6)	2.5	1.0	4	6.7	3.2	62.7	.4	.2	1.2	53.3	57.7	10.8	78.5	64.1	125.4	100.3	72.8	67.3	62.8	15.1	95.0					
1934.....	(4)	(4)	(6)	2.1	27.6	.3	18.6	2.7	34.9	.8	.8	.3	61.7	52.2	8.3	84.2	74.0	122.1	104.8	87.9	85.0	63.3	20.5	79.3					
Montana:																													
1936.....	51	(4)	5.3	1.1	(4)	12.1	4.2	3.0	20.9	(1)	(1)	4.2	44.7	100.0	34.2	121.9	91.3	212.5	193.4	108.5	140.2	81.8	6.4	76.5					
1935.....	43	(4)	5.2	1.9	17.5	3.0	6.1	3.4	60.0	.4	1.1	3.0	46.0	101.8	18.6	110.5	84.7	228.2	211.2	172.0	136.5	105.6	6.5	80.1					
1934.....	49	(4)	6.5	1.6	2.8	3.6	3.6	2.0	40.4	(7)	1.2	1.6	52.4	94.7	21.6	107.9	81.6	208.7	188.7	114.7	98.3	86.0	6.8	77.2					
Nebraska:																													
1936.....	46	19	6.8	7	1.5	8.4	1.8	1.6	27.1	.3	.6	1.8	19.0	112.2	27.7	122.8	94.7	265.0	247.1	103.1	89.0	81.4	3.4	77.5					
1935.....	47	24	6.8	6	11.5	3.5	1.2	1.5	35.9	.3	.6	1.2	22.8	102.5	20.6	135.3	105.9	217.0	198.8	130.5	114.4	68.3	3.0	50.6					
1934.....	48	18	6.2	4	2.4	1.8	8.7	1.2	22.2	.4	.6	1.2	25.3	114.0	21.1	127.4	101.4	210.7	190.0	106.0	94.2	71.4	3.1	60.6					
New Jersey:																													
1936.....	49	(4)	4.1	5	4	1.0	1.3	.5	11.3	.3	.8	2.4	51.6	122.5	32.3	101.4	85.0	338.0	315.6	90.5	88.7	50.0	3.3	82.4					
1935.....	51	(4)	4.5	5	2.4	1.1	2.8	1.2	14.7	.3	.6	.8	52.2	118.8	29.9	100.0	80.4	302.0	302.0	90.7	80.8	53.9	3.3	86.1					
1934.....	53	(4)	5.2	5	2.0	2.4	1.6	1.4	8.1	.2	.9	.3	56.0	120.6	28.9	106.7	87.3	330.4	308.7	97.2	85.6	59.9	5.1	90.4					
New York:																													
1936.....	50	19	5.6	6	1.8	2.3	1.0	.4	9.5	(2)	.7	3.0	61.5	146.1	38.1	108.7	85.0	403.7	375.8	129.6	117.9	69.9	5.2	84.9					
1935.....	52	23	5.7	4	2.7	2.3	3.0	1.0	10.6	.2	.6	2.7	61.4	143.9	35.1	103.6	80.5	378.3	344.3	122.1	110.8	69.6	6.7	88.1					
1934.....	53	23	6.0	4	2.1	1.5	1.2	.5	9.2	.5	.5	.8	63.7	139.9	34.3	78.2	53.5	407.5	349.5	128.1	115.5	73.2	7.3	90.0					

THE SELENIUM PROBLEM IN RELATION TO PUBLIC HEALTH

A Preliminary Survey to Determine the Possibility of Selenium Intoxication in the Rural Population Living on Seleniferous Soil ¹

By MAURICE I. SMITH, *Principal Pharmacologist*, K. W. FRANKE, *Consultant*,
and B. B. WESTFALL, *Assistant Chemist*, *United States Public Health Service*

INTRODUCTION

For many years there has been known to the farmers of the Great Plains of the North Central region of the United States a chronic disease in livestock commonly and erroneously referred to as "alkali" disease. The first scientific report of it appears to have been written in 1856 by Dr. T. C. Madison, who, as an Army surgeon while stationed at Fort Randall, now part of Gregory County, S. Dak., observed this condition in many cavalry horses. Madison also correctly suggested a toxic factor in the local forage as a probable cause of the disease. His suggestion seems to have been forgotten, however, for until relatively recent times the disease has been commonly associated with high-mineral content in the drinking water generally prevalent in those localities where the disease has been known to occur, hence the term "alkali" disease.

The chief characteristics of this disease as it manifests itself in horses, cattle, and hogs are loss of hair, especially from the mane and tail of horses, loss of weight and emaciation, and varying degrees of involvement of the hoofs. Excellent descriptions of the gross and microscopic pathology may be found in papers by Franke et al. (2) and Draize and Beath (3).

The true nature of so-called "alkali" disease did not become generally known until Franke (4) demonstrated the toxic character of some of the grains grown in sections of South Dakota where the disease in livestock has been more or less prevalent. Following this, Robinson (5) was able to demonstrate the presence of selenium in the grain which had been previously found to be toxic to animals. The work of Hurd-Karrer (6) furthermore demonstrated the ability of plants to assimilate selenium from the soil, and a survey by Byers (7) showed the wide though spotty distribution of selenium in the shale soils and in the grain and vegetation grown in several of the States of the North Central Great Plains.

This succession of events has thus led not only to a better understanding of the etiology of the so-called "alkali" disease in livestock, but it has also served to focus attention upon the possibility that the public health might be involved, since selenium-bearing grain and vegetation grown upon seleniferous soil may also enter into the human

¹ From the Division of Pharmacology, National Institute of Health, Washington, D. C.



FIGURE 1.



FIGURE 2.

Congenital "alkali" disease in a 14-day-old colt born of a mare that became "alkalied" during gestation. Note condition of hoofs and joints. A golden-yellow, semigelatinous effusion filled the joints of the extremities and infiltrated adjoining tissues. A similar effusion was found in the pleura and pericardium. The liver and kidneys contained 300 and 19 micrograms of selenium, respectively, per 100 grams.



dietary. It is this phase of the selenium problem with which the present report is concerned.

SCOPE AND CHARACTER OF THE INVESTIGATION

At the outset it seemed probable that, if selenium is ingested in any appreciable amount anywhere, it would be most pronounced in the rural populations subsisting largely on the products of relatively restricted soil areas. A survey was therefore instituted to cover a selected moderately large group of the farming population in three of the Great Plains States, South Dakota, Wyoming, and Nebraska. The choice of locations was determined by three factors: First, use was made of the geologic information available concerning the distribution of Cretaceous shale deposits in the soil, since, according to recent investigations, there appears to be a high incidence of selenium in such shale soils (7, 8). Second, use was made of the published chemical data by Byers (7) on the incidence and distribution of selenium in the soil and some of the vegetation in the aforementioned States. The third and the most important determining factor in this investigation was the incidence of so-called "alkali" disease in livestock. A present or past history of this disease on a given farm was considered presumptive evidence of the occurrence of selenium in the food products grown there. With very few exceptions, therefore, the material and information included in this report were secured only upon those farms and ranches where a reliable history of "alkali" disease could be obtained. Knowledge of the occurrence of the condition is frequently denied upon direct questioning, for reasons that are not difficult to see, and it has often been necessary to resort to lengthy indirect questioning before full confidence and cooperation could be secured.

As evidence of selenium ingestion by the human population and of possible harmful effects therefrom, careful note and inquiry were made concerning the health conditions of the members of families visited. Information was obtained regarding the dietary habits of the family groups to ascertain to what extent the foodstuffs produced locally actually entered into their dietary. Wherever possible, general physical examination was made in an attempt to discover one or more symptoms that might be considered sufficiently characteristic of selenium intoxication to be of probable aid in diagnosis. In this the supposed toxicological similarity of selenium to arsenic was always borne in mind, and the typical symptomatology of "alkali" disease was used as a guide. Finally, in suitable cases samples of urine were secured for chemical analysis for selenium in the belief that, if found, it would not only furnish direct proof of the ingestion of this element but might also be helpful in appraising the value of the clinical observations and findings.

The entire survey extended over a period of about 6 weeks, from the latter part of April to early June. With few exceptions little or no home-grown garden food, which might be considered as the most probable source of selenium, was being consumed at the time, since it was too early for the new supply, and there are usually not enough garden vegetables raised there to provide a liberal supply for the entire year. Thus the chief dietary constituents that might possibly have carried selenium at that time were meats, milk and milk products, eggs, and a relatively limited amount of garden vegetables raised during the preceding year. Home-grown grain usually constitutes an important source of food for the animals, but probably little of it is used by the family group directly.

The survey comprised an examination of 111 families living on farms or ranches in the following States and counties: Eastern border of Wyoming—Albany and Niobrara Counties; southwestern South Dakota—Fall River, Custer, Pennington, Meade, Stanley, Hughes, Jones, Lyman, Tripp, Brule, and Gregory; Northern Nebraska—Boyd County. One hundred and sixty-seven subjects of those families were selected as suitable donors for urinary specimens. However, only 127 specimens were actually received in satisfactory condition and examined. These specimens represented 90 of the 111 families visited.

It may be of interest to note in passing that active so-called "alkali" disease in horses, cattle, or hogs was seen on only 11 farms, though in nearly all cases there was a very definite past history of this disturbance. In Wyoming this disease is often referred to as "blind staggers", apparently a more acute manifestation of selenium intoxication, if we may accept the views of Beath and his associates on this subject (3, 8).

URINARY ANALYSIS FOR SELENIUM

The method we have used for selenium determination is based on that developed by Byers and his associates for its determination in organic material (9, 10). Briefly, our procedure is as follows:

Fifty to 500 cc of urine,² according to the amount of selenium present, are treated in a Pyrex beaker with 25 cc of concentrated nitric acid, 30 cc of 30 percent hydrogen peroxide,³ and 25 cc of concentrated sulphuric acid for 6 hours at room temperature. Thirty cc of hydrogen peroxide are added, and the mixture is then slowly evaporated on the water bath at 80° C. until nitric acid fumes begin to come off in appreciable amount. Additional quantities of 40 cc of concentrated nitric acid and 20 cc of concentrated sulphuric acid are then added and the oxidation process is continued on the hot plate

² We have used thymol or toluol as preservative.

³ Merck's "Superoxol", and the cheaper product, DuPont's "Perone" have been found equally satisfactory.

for several hours until all traces of nitric acid have been removed, taking care that the temperature of the mixture does not exceed 120° to 122° C. The residue consisting of about 60 cc is then transferred quantitatively with the aid of about 40 cc of water to an all glass, Pyrex distillation apparatus,⁴ 80 cc of 48 percent hydrobromic acid and about 0.5 cc of bromine are added, and the mixture is distilled into a 100-cc wide mouth Erlenmyer flask until about 75 cc of distillate have been collected. The ice-chilled distillate is then treated with sulphur dioxide until the bromine is completely discharged, about 0.5 gram of hydroxylamine hydrochloride is added, and the mixture is heated at 80° C. for 15 to 20 minutes.

In the presence of as little as 0.01 to 0.02 mg of selenium a fine distinctly perceptible red precipitate separates out over night. The precipitate is collected on an asbestos pad by suction filtration through a small Gooch crucible, washed with a little water containing some hydrobromic acid, dissolved with the aid of 5 cc of 1:10 bromine in hydrobromic acid, the solution being filtered into a 25 cc volumetric flask or accurately graduated cylinder, water is then added to make about 20 cc, sulphur dioxide gas is passed in to discharge the bromine, 1 cc of 10 percent hydroxylamine hydrochloride in 0.15 percent gum acacia is added, sufficient water is added to make 25 cc, and the mixture is heated at 80° C. for about 15 minutes. A set of standards is made up simultaneously, using suitable amounts of a stock standard solution of 0.05 mg selenium per cc in dilute aqueous solution of hydrobromic acid.⁵ The standards are treated with bromine in hydrobromic acid, sulphur dioxide, and hydroxylamine hydrochloride in gum acacia solution in exactly the same manner as the unknowns. After cooling the solutions readings are made in the nephelometer,⁶ matching the unknown against the nearest standard set at 20 on the scale.

The range of selenium that is most satisfactorily estimated in this manner is 0.01 mg to 0.1 mg. Quantities in excess of 0.1 mg are difficult to estimate accurately by means of the nephelometer. The limit of sensitivity of the method as we have used it is 0.005 mg of selenium. Having used in this work quantities of urine up to 500 cc, we have, therefore, been able to detect with a fair degree of certainty quantities as low as 1 to 2 micrograms per 100 cc. Five micrograms percent or more can be estimated by this method with an accuracy of ± 10 percent. In urine specimens collected in the laboratory from 20 normal individuals residing in Washington and nearby Maryland or Virginia we have been unable to detect selenium, and so if our control urines contained any selenium it was less than the order of magnitude of 1 to 2 micrograms percent.

⁴ Manufactured by Will Corporation, Rochester, N. Y.

⁵ The standard is made from an aqueous solution of Na_2SeO_3 analyzed for selenium gravimetrically.

⁶ Klett colorimeter-nephelometer has been used in this work.

RESULTS AND DISCUSSION OF THEIR PROBABLE MEANING

We shall attempt to present the results of this investigation in summary fashion without omitting the more essential details. The findings will be discussed first from the clinical point of view and, second, from the point of view of the chemical data obtained in the urinary analysis for selenium.

From the clinical standpoint we may state at once that no symptom or group of symptoms could be discovered so far that might be considered pathognomonic of selenium poisoning in man. This is entirely in accord with the experience of local physicians with many of whom the problem was discussed. No serious illness was seen in any of the 111 families visited that could have been definitely attributed to selenium poisoning. Vague symptoms of ill health, and symptoms indicative of more or less serious damage to the liver, kidneys, skin, and joints were seen, and the impression was gained that the incidence of such disorders was rather high. It is evident, however, that the causes for such disorders are many, and in the present state of our knowledge it is impossible to determine the role of selenium, if any, in their causation. Respiratory diseases, on the other hand, were infrequently seen.

The following presents a broad statistical summary of the more pronounced disease states seen in the 111 families visited, exclusive of the more vague symptoms of anorexia, indigestion, general pallor, malnutrition, etc.:

1. Bad teeth, varying from marked discoloration through all stages of decay, were seen in one or more members of 48 families.

2. Yellowish discoloration of the skin, in many cases a very definite icterus, and in some cases seemingly associated with more or less definite liver disease, was seen in about 46 subjects.

3. Skin eruptions of varying degrees of severity, but not conforming to any one particular type, were seen in 20 subjects.

4. Chronic arthritis with more or less permanent changes in the joints was seen in 15 subjects. All degrees of involvement were noted in this group of patients, varying from the milder types of rheumatoid arthritis to the more severely deforming type of arthritis deformans. The hypertrophic degenerative type of arthritis was not seen.

5. Diseased nails of the fingers, and in some cases also of the toes, were seen in eight subjects. They were usually symmetrical, atrophic, brittle, irregular, and often presented transverse and at times longitudinal ridging. In some of the cases there was a history of sloughing of the diseased nails at irregular intervals. With the exception

of one case there was no history of suppuration, and no evidence of acute or subacute inflammation.

6. Lastly, subcutaneous edema of probably cardio-renal origin was seen in five cases, and peripheral neuritis of doubtful etiology was seen in two subjects. Fifteen subjects gave a history of more or less protracted gastrointestinal disturbances.

Whether or not selenium is implicated in any or all of the above conditions cannot be stated with any degree of certainty. In the discussion to follow, on the urinary selenium, an attempt will be made to correlate the clinical findings with the selenium concentration in the urine, and there we shall endeavor to point out probability or lack of probability as to cause and effect.

The urinary analysis for selenium revealed the following facts: One hundred and twenty-seven specimens, of as many subjects, representing 90 of the 111 families that had been visited, were received in good condition and were analyzed. The great majority of the specimens, more than 92 percent in fact, contained selenium, many in appreciable quantities, and some in amounts so high as to suggest probable intoxication, especially if viewed in the light of the small number of observations made on animals affected with so-called "alkali" disease. The concentration of urinary selenium is shown in some detail in table 1, where the whole series has been divided arbitrarily into seven groups, according to the amount of selenium found. It will be noted that the highest amount of selenium found in the urine of this series of cases was 133 micrograms percent.

TABLE 1.—*Urinary selenium concentration in 127 subjects, representing 90 families*

Group	Selenium, micrograms per 100 cc	Number of subjects	Percent of total
1.....	0.....	4	3.1
2.....	Trace.....	6	4.8
3.....	2 to 9.....	35	27.6
4.....	10 to 19.....	22	17.3
5.....	20 to 49.....	37	29.2
6.....	50 to 99.....	19	14.9
7.....	100 to 133.....	4	3.1

In a small series of urines obtained from three horses and one colt in various stages of "alkali" disease the selenium concentration ranged from 33 to 170 micrograms per 100 cc, as follows:

(1) Colt urine, autopsy specimen (see figs. 1 and 2), 33 micrograms per 100 cc; (2) catheterized specimen, horse no. 1, 100 micrograms per 100 cc; (3) catheterized specimen, horse no. 2, 125 micrograms per 100 cc; (4) catheterized specimen, horse no. 3, 170 micrograms per 100 cc.

In table 2 an attempt is made to correlate the clinical findings with the urinary selenium concentration. The cases are divided arbitrarily into seven groups, as in table 1, according to the selenium concentra-

tion in the urine; the number of cases showing symptoms, their ages, and the types of symptoms and their incidence are given in separate columns. The symptoms are given in the order of apparent greatest importance as regards probable cause and effect.

Analysis of the data given in table 2 does not reveal a constant causal association of health disturbances with selenium excreted in the urine. It may be fairly assumed that a higher concentration of selenium in the urine probably represents a higher level of intake, and a correspondingly higher concentration in the tissues; nevertheless, with the exception of the negative group, which is too small for statistical purposes anyway, there is but little difference in the percentage of symptomatic cases in the six groups with a wide selenium range in the urine from a trace to 133 micrograms percent. The percentage of symptomatic cases in these 6 groups runs irregularly from 63 to 75, it being almost the same in the low-selenium as in the high-selenium groups.

TABLE 2.—*Urinary selenium concentration in relation to age and clinical symptomatology*

Selenium, micrograms per 100 cc	Number of cases	Ages	Number showing symptoms	Age (years)	Symptoms and their incidence
0.....	4	10-42	1	42	Bad teeth, dermatitis.
Trace.....	6	10-62	4	19-62	Ictericoid skin (2), bad teeth (1), dermatitis (2), gastrointestinal (1), edema (1).
2 to 9.....	35	5-70	22	12-70	Ictericoid skin (8), bad teeth (12), dermatitis (6), arthritis (4), gastrointestinal (3), pathological nails (2), edema (2).
10 to 19.....	22	7-64	15	7-64	Ictericoid skin (7), bad teeth (7), dermatitis (3), arthritis (4), pathological nails (1).
20 to 49.....	37	1-65	25	1-65	Ictericoid skin (11), bad teeth (11), dermatitis (4), arthritis (2), gastrointestinal (4), pathological nails (2), anemia (1). ¹
50 to 99.....	19	4-62	13	35-62	Ictericoid skin (7), bad teeth (6), dermatitis (4), arthritis (4), gastrointestinal (2), pathological nails (2), edema (2).
100 to 133.....	4	6-68	3	20-68	Ictericoid skin (3), bad teeth (1), gastrointestinal (3).

¹This was a case of severe hypochromic anemia with intestinal hemorrhages of unknown etiology in a 1-year-old baby referred to by Dr. E. B. Bradley of Spencer, Nebr. The urinary selenium was 32 micrograms per 100 cc.

The lack of more definite association of clinical evidence of selenium intoxication with its concentration in the urine does not, however, warrant the assumption of its harmlessness. Indeed we have the rather strong impression that some of the signs of ill health, though neither of a specific nor, in most cases, of a serious nature, may probably be the direct result of more or less continuous ingestion of small quantities of selenium over a long period of time. The high incidence of symptoms in the groups excreting relatively small quantities of selenium may be explained on the assumption that they are the manifestations of chronic irreparable damage wrought by the ingestion of the element in higher concentrations at some time in the past. Indeed, the amount of selenium ingested must of necessity

vary from time to time with changing climatic conditions, which undoubtedly have an effect upon the availability of locally produced selenium-bearing foodstuffs. The more surprising thing to us is that there is not greater definite evidence of serious injury, particularly in the groups showing the higher concentrations of selenium in the urine.

Selenium, as inorganic selenite or selenate, is a highly toxic element. It is often compared toxicologically with arsenic. Its acute toxicity on intravenous injection in rats we have found to be about two times as great as that of arsenic in the form of arsenite, the minimum lethal dose of selenium being 3.0 mg per kilo while that of arsenic is about 5 to 6 mg per kilo. It should be borne in mind that, according to the best available evidence, the selenium in selenium-bearing foodstuffs is in organic combination (11, 12) and may possibly have a different fate in the body from inorganic selenium even though its toxicity appears to be at least as great (13). More detailed information regarding the sources of selenium, accurate knowledge concerning the quantitative relationship between the selenium excreted to that ingested and stored in the tissues, more intimate knowledge concerning the chemical nature of the compound or compounds of selenium occurring in foodstuffs, and a thorough knowledge of the fate of these compounds in the body are some phases of the general problem requiring solution before its public health significance can be fully appreciated. Some of these problems are now under investigation.

From the standpoint of clinical diagnosis we can offer but little information. None of the subjects we have studied presented many symptoms suggestive of a similarity to chronic arsenic poisoning. We were impressed with the high incidence of icteroid discoloration of the skin and believe that this may have some significance. The high frequency of bad teeth seen in the subjects of our study may or may not have some significance. The same may be said of the rather high incidence of arthritis and of pathological disturbances in the nail structures. These symptoms are suggestive in view of the not infrequent occurrence of joint involvement in "alkalied" animals in association with the disturbance in the hoofs which is almost pathognomonic of this disease.

It has already been pointed out that the most pronounced symptoms and manifestations of ill health seen in the series of cases were (1) bad teeth, (2) icteroid skin, (3) dermatitis, (4) arthritis, (5) gastrointestinal disturbances, and (6) diseased nails. To arrive at some conclusion as to the probable diagnostic significance of the above-named symptoms, all the cases of the entire series, the urines of which had been analyzed for selenium, were divided into the above clinical groups and the number of cases in each clinical group associated with no or with relatively high urinary selenium, respectively, was calculated on a percentage basis, as shown in table 3. In the analysis,

none or a trace is considered as no selenium, while 20 micrograms or more are considered as relatively high and assumed to be of probable significance.

TABLE 3.—*Association of certain clinical groups with urinary selenium*

Clinical group	Total number of cases with complete data on urinary selenium	Percent of cases showing—	
		No selenium in the urine	20 or over micrograms per 100 cc
Bad teeth.....	34	6	47
Icteric discoloration of the skin.....	36	11	53
Dermatitis.....	19	16	31
Arthritis.....	13	0	30
Gastrointestinal.....	14	0	57
Pathological nails.....	7	0	57
Asymptomatic group.....	22	14	32

Inspection of the table will show that relatively high urinary selenium is most often associated with pathological disturbances of the nails, with gastrointestinal disorders, and with icteroid skin. The incidence of high urinary selenium in the clinical groups of dermatitis and arthritis was no greater than in the symptomless group.

Probably all that can be said at this time is that, in the presence of any or all of the above symptoms in an individual with a history of exposure to selenium through association with seleniferous soil and so-called "alkali" disease in livestock, a careful and thorough analysis of the urine for selenium should be made. A careful consideration of the findings in relation to the symptomatology may help to account for some of the obscure ailments in selenium-endemic regions.

SUMMARY AND CONCLUSIONS

A survey has been made of some of the rural population of parts of Wyoming, South Dakota, and Nebraska to determine the possibility of selenium intoxication through the ingestion of locally produced selenium-bearing foodstuffs.

A series of 111 families was studied for clinical evidence of selenium intoxication, and a series of 127 urines of as many subjects, representing 90 families, was analyzed for this element.

Many vague symptoms of ill health and some of a more serious nature were seen, most of which could be classified into six major clinical groups, none of which was sufficiently characteristic to be ascribed to the ingestion of selenium exclusively.

The results of the urinary analysis showed that only 8 percent of the cases were free or nearly free of selenium, while 92 percent contained amounts varying from 2 to 133 micrograms of selenium per 100 cc. This affords definite proof of the absorption of selenium by some of the rural population in the foregoing States.

The question as to the effects of selenium, in the quantities ingested, on the health of the population remains an open one.

ACKNOWLEDGMENTS

Our sincere thanks are due to E. P. Painter, South Dakota Experiment Station, Brookings, for carrying out many selenium analyses; to Drs. T. H. Ruth, director, animal husbandry, Pierre, S. Dak., and G. W. Cronen, assistant veterinary, United States Bureau of Animal Industry, Pierre, S. Dak., for valuable aid in securing animal material; and to Dr. O. A. Beath, Wyoming Agricultural Experiment Station, at Laramie, for much help in securing human material in Albany County, Wyo.

REFERENCES

- (1) Madison, T. C.: 36th Cong., 1st sess. Senate Ex. Doc., No. 52, pp. 37-41 (1860). Cited by Franke et al. (2)
- (2) Franke, K. W., Rice, T. D., Johnson, A. G., and Schoening, H. W.: U. S. Dept. Agric. Circular No. 320 (1934).
- (3) Draize, H. J., and Beath, O. A.: J. Am. Vet. Med. Assoc., **86**: 753 (1935).
- (4) Franke, K. W.: J. Nutr., **8**: 597 (1934).
- (5) Robinson, O. W.: J. Assoc. Off. Agr. Chem., **16**: 423 (1933).
- (6) Hurd-Karrer, A. M.: J. Agric. Res., **50**: 413 (1935).
- (7) Byers, H. G.: U. S. Dept. Agric. Tech. Bull. No. 482 (1935).
- (8) Beath, O. A., Eppson, H. F., and Gilbert, C. S.: Univ. of Wyoming Agric. Exp. Station Bull. No. 206 (1935).
- (9) Robinson, O. W., Dudley, H. C., Williams, K. T., and Byers, H. G.: J. Ind. Eng. & Chem., Anal. Ed., **6**: 274 (1934).
- (10) Williams, K. T., and Lakin, H. W.: J. Ind. Eng. Chem., Anal. Ed., **7**: 409 (1935).
- (11) Franke, K. W.: J. Nutrition, **8**: 609 (1934).
- (12) Horn, M. J., Nelson, E. M., and Jones, D. B.: Cer. Chem., **13**: 126 (1936).
- (13) Franke, K. W., and Potter, Van R.: J. Nutr., **10**: 213 (1935).

PLAGUE INFECTION IN FLEAS FROM MONTEREY COUNTY, AND THE LAKE TAHOE REGION, CALIFORNIA

According to a report dated October 13, 1936, to Senior Surgeon C. R. Eskey from Dr. K. F. Meyer, of the Hooper Foundation, University of California, plague infection in fleas has been proved by guinea-pig inoculation as follows:

Fleas collected from ground squirrels (*Citellus beecheyi*) in the San Ardos area of Monterey County.

Pooled fleas taken from chipmunks (genus *Eutamias*) and ground squirrels (*Citellus beecheyi* and genus *Callospermophilus*) in the Lake Tahoe region.

A human case of plague was reported from Monterey County in June of this year,¹ but this is the first evidence of plague in ground squirrels in this county since 1931.

The fleas collected near Lake Tahoe were from the region where a human case of plague occurred in July of this year.²

¹ Public Health Reports, July 10, 1936, p. 939.

² Public Health Reports, Oct. 2, 1936, p. 1392.

COURT DECISION ON PUBLIC HEALTH

Tuberculosis, contracted by employee in business of manufacturing women's dresses because of conditions of employment, held not compensable as occupational disease under workmen's compensation act.— (Connecticut Supreme Court of Errors; *Madeo v. I. Dibner & Bro., Inc., et al.*, 186 A. 616; decided July 30, 1936.) An employee in the business of manufacturing women's dresses claimed compensation under the Workmen's Compensation Act for disability due to pulmonary tuberculosis. The finding disclosed that the tuberculosis from which she suffered was contracted because of conditions of employment. The commissioner awarded compensation, but the trial court sustained the appeal of the defendants, and plaintiff appealed to the supreme court of errors.

The compensation act defined a personal injury as including "occupational disease", which, in turn, was defined as "a disease peculiar to the occupation in which the employee was engaged and due to causes in excess of the ordinary hazards of employment as such."

The supreme court quoted from a prior case in which it had said that "to come within the definition, an occupational disease must be a disease which is a natural incident of a particular occupation, and must attach to that occupation a hazard which distinguishes it from the usual run of occupations and is in excess of that attending employment in general." Regarding this definition, the court, in the instant opinion, stated that "It does not include a disease which results from the peculiar conditions surrounding the employment of the claimant in a kind of work which would not from its nature be more likely to cause it than would other kinds of employment carried on under the same conditions." "In this case", said the court, "the plaintiff's disease resulted from the conditions of her particular employment in the factory of the defendants. Other trades carried on under those conditions would have been as likely to cause the disease as the manufacture of dresses."

The action of the trial court in denying compensation was sustained.

DEATHS DURING WEEK ENDED OCTOBER 10, 1936

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 10, 1936	Correspond- ing week, 1935
Data from 86 large cities of the United States:		
Total deaths.....	7,885	7,556
Deaths per 1,000 population, annual basis.....	11.0	10.5
Deaths under 1 year of age.....	619	469
Deaths under 1 year of age per 1,000 estimated live births.....	56	43
Deaths per 1,000 population, annual basis, first 41 weeks of year.....	12.1	11.4
Data from industrial insurance companies:		
Policies in force.....	68,555,395	67,711,405
Number of death claims.....	10,659	11,077
Death claims per 1,000 policies in force, annual rate.....	8.1	8.5
Death claims per 1,000 policies, first 41 weeks of year, annual rate.....	9.9	9.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Oct. 17, 1936, and Oct. 19, 1935

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 17, 1936, and Oct. 19, 1935

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935
New England States:								
Maine.....	3	1	1			31	0	0
New Hampshire.....					2		0	0
Vermont.....						30	0	0
Massachusetts.....	2	10			68	38	1	1
Rhode Island.....	1				1	8	1	1
Connecticut.....	2	5	3	2	8	30	1	0
Middle Atlantic States:								
New York.....	17	30	13	10	55	144	8	12
New Jersey.....	17	13	10	9	33	15	0	0
Pennsylvania.....	24	54			26	45	4	5
East North Central States:								
Ohio.....	45	65	20	20	8	31	7	7
Indiana.....	40	89	22	17	1	5	5	1
Illinois.....	24	66	10	9	11	15	2	6
Michigan.....	5	13	2	4	10	36	1	1
Wisconsin.....	6	5	27	30	10	40	0	1
West North Central States:								
Minnesota.....	13	17	4	1	10	8	3	0
Iowa.....	7	8	5		3		2	0
Missouri.....	29	64	77	56	1	9	1	4
North Dakota.....		4			1	9	0	1
South Dakota.....	1	11		1	1	8	1	0
Nebraska.....	4	15			1	3	1	0
Kansas.....	7	23			1	2	0	2
South Atlantic States:								
Delaware.....		1				7	0	0
Maryland.....	21	18	10	10	4	10	2	4
District of Columbia.....	6	6		1	3		0	2
Virginia.....	38	66			6	9	9	4
West Virginia.....	40	53	19	15		5	0	1
North Carolina.....	140	119	4	8	7	3	1	4
South Carolina.....	5	26	98	109	1	3	0	1
Georgia.....	54	33					1	1
Florida.....	3	18	3	2		9	0	0

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended Oct. 17, 1936, and Oct. 19, 1935—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935
East South Central States:								
Kentucky.....	27	59	9	10	3	51	2	1
Tennessee.....	65	88	18	4	3		2	1
Alabama.....	35	43	26	25		3	2	1
Mississippi.....	22	25					0	0
West South Central States:								
Arkansas.....	8	17	27	10		1	0	0
Louisiana.....	20	26	6	8	3	3	1	3
Oklahoma.....	10	9	49	37	8	2	0	0
Texas.....	57	130	123	130	3	3	2	1
Mountain States:								
Montana.....	1	1	37		1	27	0	0
Idaho.....			1	1	67	1	0	0
Wyoming.....		1			1	20	0	3
Colorado.....	8	13			2	3	2	0
New Mexico.....	8	14	4		21	13	0	0
Arizona.....	7	1	34	20			2	0
Utah.....	1				1	1	0	0
Pacific States:								
Washington.....		2			5	53	0	0
Oregon.....	2	1	20	15	7	162	0	0
California.....	49	65	14	30	16	116	3	3
Total.....	883	1,328	705	654	422	1,012	67	72
First 42 weeks of year.....	20,021	26,026	144,721	108,230	273,299	701,383	6,476	4,727

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935
New England States:								
Maine.....	1	8	15	14	0	0	0	2
New Hampshire.....	1	2	7	3	0	0	0	0
Vermont.....	0	2	2	7	0	0	0	0
Massachusetts.....	2	47	72	149	0	0	4	4
Rhode Island.....	0	9	17	5	0	0	0	0
Connecticut.....	1	17	15	24	0	0	1	5
Middle Atlantic States:								
New York.....	14	84	153	321	0	0	25	20
New Jersey.....	0	26	34	75	0	0	3	3
Pennsylvania.....	8	13	177	297	0	0	43	42
East North Central States:								
Ohio.....	45	3	185	303	0	0	16	24
Indiana.....	3	3	59	125	1	1	1	7
Illinois.....	53	7	177	399	1	2	7	17
Michigan.....	11	16	104	135	0	0	14	10
Wisconsin.....	3	1	126	383	1	9	1	7
West North Central States:								
Minnesota.....	2	3	45	176	10	0	0	4
Iowa.....	7	7	66	93	8	2	4	7
Missouri.....	8	1	57	132	0	6	23	11
North Dakota.....	4	1	19	32	11	0	3	1
South Dakota.....	0	0	21	34	2	2	1	1
Nebraska.....	1	0	24	57	1	6	0	1
Kansas.....	1	0	40	80	3	0	2	8
South Atlantic States:								
Delaware.....	0	0	4	5	0	0	1	6
Maryland.....	3	3	39	63	0	0	9	18
District of Columbia.....	0	1	6	14	0	0	0	2
Virginia.....	1	7	21	60	0	0	24	6
West Virginia.....	3	1	80	137	0	0	14	12
North Carolina.....	2	8	88	95	0	0	9	5
South Carolina.....	5	1	9	17	0	0	6	6
Georgia.....	9	0	15	25	0	0	28	8
Florida.....	3	0	2	3	0	0	1	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Oct. 17, 1936, and Oct. 19, 1935—Continued

Division and State	Polio-myelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935	Week ended Oct. 17, 1936	Week ended Oct. 19, 1935
East South Central States:								
Kentucky.....	4	13	53	104	0	0	26	19
Tennessee.....	18	0	65	83	0	0	14	23
Alabama ¹	5	1	33	20	0	0	18	4
Mississippi.....	4	1	18	28	0	0	7	8
West South Central States:								
Arkansas.....	9	2	6	12	0	0	7	5
Louisiana ¹	1	3	9	10	0	0	16	13
Oklahoma ²	0	0	5	11	0	0	26	11
Texas ³	1	3	20	62	0	5	15	38
Mountain States:								
Montana.....	0	1	33	77	31	2	2	3
Idaho.....	3	0	37	21	2	0	1	0
Wyoming.....	0	0	6	32	1	0	0	0
Colorado.....	1	0	16	89	5	0	1	3
New Mexico.....	2	0	14	16	0	0	16	35
Arizona.....	0	1	7	8	0	0	4	2
Utah ⁴	0	1	13	56	0	0	0	0
Pacific States:								
Washington.....	0	2	39	51	1	4	6	4
Oregon.....	4	5	15	50	0	0	4	2
California.....	13	20	149	154	0	2	9	12
Total.....	246	324	2,277	4,147	78	41	412	422
First 42 weeks of year.....	3,358	9,615	195,947	198,862	6,391	5,606	11,850	14,031

¹ New York City only.

² Week ended earlier than Saturday.

³ Typhus fever cases, week ended Oct. 17, 1935, 53 cases, as follows: North Carolina, 2; South Carolina,

2; Georgia, 30; Alabama, 15; Louisiana, 1; Texas, 3.

⁴ Exclusive of Oklahoma City and Tulsa.

⁵ Two paralytic cases included.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following reports of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Menin- gococ- cus menin- gitis	Diph- theria	Influa- enza	Mala- ria	Meas- les	Pellag- ra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>August 1936</i>										
New Mexico.....	1	13	2	8	19	2	1	23	0	36
North Dakota.....		6	2		1			12	9	2
Puerto Rico.....		46	79	2,021	91		3		0	70
<i>September 1936</i>										
Alabama.....	6	130	33	1,249		17	39	49	0	83
Idaho.....		2	3		1		3	20	0	11
Indiana.....	5	41	33		17		13	136	0	46
Iowa.....	2	13		2	9		24	93	11	15
Maryland.....	14	37	13	10	34	1	16	74	0	46
Massachusetts.....	4	28		3	106	1	8	188	0	19
Michigan.....	10	53	1	17	46		37	323	5	41
Minnesota.....	2	35	3	1	29		10	94	5	14
New Mexico.....	1	8	3	14	42	2	10	20	0	75
North Dakota.....		3	21		4		4	25	17	5
Ohio.....	12	88	35	5	57	1	108	431	2	193
Pennsylvania.....	13	86		1	94	1	27	425	0	130
South Carolina.....		333	341	1,623	2	78	0	22	0	46

August 1936

	Cases
New Mexico:	
Chickenpox.....	7
Conjunctivitis.....	1
Dysentery (amoebic).....	1
Dysentery (bacillary).....	32
Epidemic encephalitis.....	3
German measles.....	1
Mumps.....	16
Paratyphoid fever.....	1
Septic sore throat.....	1
Trachoma.....	1
Whooping cough.....	51
North Dakota:	
Chickenpox.....	11
Mumps.....	2
Trachoma.....	1
Puerto Rico:	
Chickenpox.....	13
Dysentery.....	75
Filariasis.....	1
Mumps.....	16
Ophthalmia neonatorum.....	4
Puerperal septicemia.....	9
Tetanus.....	9
Tetanus, infantile.....	9
Trachoma.....	1
Whooping cough.....	23

September 1936

Anthrax:	
Pennsylvania.....	1
Chickenpox:	
Alabama.....	2
Idaho.....	4
Indiana.....	6
Iowa.....	11
Maryland.....	14
Massachusetts.....	75
Michigan.....	120
Minnesota.....	56
New Mexico.....	12
North Dakota.....	10
Ohio.....	98
Pennsylvania.....	244
South Carolina.....	13
Diarrhea:	
Maryland.....	67
Ohio (under 2 years, enteritis included).....	86
South Carolina.....	471
Dysentery:	
Maryland.....	84
Massachusetts (bacillary).....	1
Michigan (amoebic).....	4
Michigan (bacillary).....	7
Minnesota (amoebic).....	4
Minnesota (bacillary).....	6
New Mexico (bacillary).....	15
Ohio (bacillary).....	10
Pennsylvania (amoebic).....	1

September 1936—Continued

	Cases
Dysentery—Continued.	
Pennsylvania (bacillary).....	1
Epidemic encephalitis:	
Indiana.....	1
Iowa.....	2
Maryland.....	3
Massachusetts.....	2
New Mexico.....	1
North Dakota.....	2
Ohio.....	2
German measles:	
Iowa.....	2
Maryland.....	8
Massachusetts.....	32
New Mexico.....	1
Ohio.....	20
Pennsylvania.....	21
Hookworm disease:	
South Carolina.....	90
Impetigo contagiosa:	
Maryland.....	31
Lead poisoning:	
Maryland.....	3
Massachusetts.....	2
Michigan.....	2
Ohio.....	9
Pennsylvania.....	1
Mumps:	
Alabama.....	25
Idaho.....	15
Indiana.....	18
Iowa.....	17
Maryland.....	118
Massachusetts.....	180
Michigan.....	112
New Mexico.....	34
North Dakota.....	4
Ohio.....	55
Pennsylvania.....	229
South Carolina.....	23
Ophthalmia neonatorum:	
Alabama.....	1
Maryland.....	2
Massachusetts.....	90
Ohio.....	74
Pennsylvania.....	8
South Carolina.....	10
Paratyphoid fever:	
Maryland.....	1
Michigan.....	5
New Mexico.....	2
Ohio.....	2
South Carolina.....	7
Rabies in animals:	
Alabama.....	46
Indiana.....	57
Massachusetts.....	4
Michigan.....	6
New Mexico.....	1
South Carolina.....	21
Rabies in man:	
Alabama.....	1
Pennsylvania.....	1

September 1936—Continued

	Cases
Rocky Mountain spotted fever:	
Maryland.....	4
Septic sore throat:	
Idaho.....	1
Maryland.....	9
Massachusetts.....	3
Michigan.....	14
Minnesota.....	3
New Mexico.....	3
North Dakota.....	1
Ohio.....	52
Tetanus:	
Alabama.....	5
Maryland.....	2
Massachusetts.....	4
Ohio.....	3
Pennsylvania.....	3
Trachoma:	
Iowa.....	13
Massachusetts.....	4
Michigan.....	1
Ohio.....	3
Trichinosis:	
Massachusetts.....	3
Tularemia:	
Idaho.....	1
Minnesota.....	2
Ohio.....	2
South Carolina.....	1
Typhus fever:	
Alabama.....	33
Michigan.....	2
South Carolina.....	4
Undulant fever:	
Alabama.....	1
Indiana.....	2
Iowa.....	12
Maryland.....	8
Massachusetts.....	6
Michigan.....	10
Minnesota.....	2
New Mexico.....	6
Ohio.....	4
Pennsylvania.....	11
Vincent's infection:	
Idaho.....	1
Maryland.....	13
Michigan.....	31
North Dakota.....	6
Whooping cough:	
Alabama.....	35
Idaho.....	5
Indiana.....	42
Iowa.....	41
Maryland.....	527
Massachusetts.....	569
Michigan.....	762
Minnesota.....	236
New Mexico.....	17
Ohio.....	724
Pennsylvania.....	1,506
South Carolina.....	38

PLAGUE INFECTION IN MONTEREY AND PLACER COUNTIES, CALIF.

Under date of October 13, 1936, plague infection was reported proved by animal inoculation in fleas taken from rodents collected around Lake Tahoe, in the Carnelian Bay area, Placer County, Calif., and in the San Ardos area in Monterey County, Calif. (See a more detailed report on p. 1505.)

CASES OF VENEREAL DISEASES REPORTED FOR AUGUST 1936

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama ¹				
Arizona ¹				
Arkansas	185	0.93	95	0.48
California	1,167	2.07	1,196	2.12
Colorado ²				
Connecticut ³	218	1.27	189	1.10
Delaware	131	5.12	66	2.58
District of Columbia ¹				
Florida	188	1.16	76	.47
Georgia	1,255	3.75	462	1.38
Idaho	13	.27	30	.63
Illinois	1,163	1.49	1,071	1.37
Indiana	110	.32	148	.43
Iowa	88	.35	184	.73
Kansas	59	.32	74	.40
Kentucky	135	.47	274	.96
Louisiana ⁴	186	.88	111	.52
Maine	30	.86	44	.52
Maryland	671	4.02	267	1.60
Massachusetts	462	1.06	562	1.28
Michigan	396	.85	569	1.22
Minnesota	254	.97	350	1.33
Mississippi	1,564	7.98	2,229	11.37
Missouri	363	.94	117	.30
Montana	30	.56	86	1.62
Nebraska	35	.26	86	.63
Nevada ¹				
New Hampshire	5	.10	34	.68
New Jersey	712	1.66	341	.80
New Mexico	44	1.09		
New York	7,254	8.63	2,099	1.63
North Carolina	1,804	8.28	612	1.79
North Dakota ¹				
Ohio ¹	558	.83	265	.40
Oklahoma ¹	192	.77	200	.80
Oregon	72	.71	182	1.81
Pennsylvania	283	.28	200	.20
Rhode Island	128	1.88	89	1.31
South Carolina ²	249	1.24	323	1.61
South Dakota	11	.16	40	.59
Tennessee	573	1.97	376	1.29
Texas	203	.33	99	.16
Utah ¹				
Vermont	27	.72	38	1.01
Virginia	564	2.14	328	1.24
Washington	179	1.10	330	2.08
West Virginia	220	1.21	138	.76
Wisconsin ⁴	14	.05	196	.67
Wyoming ¹				
Total	21,800	1.80	14,185	1.17

See footnotes at end of table.

Reports from cities of 200,000 population or over

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Akron, Ohio.....	26	0.96	15	0.55
Atlanta, Ga. ¹				
Baltimore, Md.....	371	4.50	180	2.18
Birmingham, Ala.....	124	4.39	66	2.34
Boston, Mass.....	203	2.57	204	2.58
Buffalo, N. Y.....	182	3.07	68	1.15
Chicago, Ill.....	800	2.24	797	2.23
Cincinnati, Ohio ¹				
Cleveland, Ohio.....	163	1.75	105	1.13
Columbus, Ohio.....	42	1.37		
Dallas, Tex.....	28	.97	115	3.97
Dayton, Ohio ¹				
Denver, Colo.....	36	1.21	42	1.42
Detroit, Mich.....	230	1.33	311	1.80
Houston, Tex. ¹	235	7.02	82	2.45
Indianapolis, Ind. ¹				
Jersey City, N. J. ¹				
Kansas City, Mo.....	77	1.83	3	.07
Los Angeles, Calif. ¹				
Louisville, Ky.....	263	8.12	118	3.64
Memphis, Tenn.....	222	8.31	74	2.77
Milwaukee, Wis. ¹				
Minneapolis, Minn.....	56	1.15	115	2.36
Newark, N. J.....	254	5.48	124	2.68
New Orleans, La. ¹				
New York, N. Y.....	5,387	7.38	1,257	1.72
Oakland, Calif.....	34	1.12	28	.92
Omaha, Nebr.....	15	.68	16	.73
Philadelphia, Pa.....	190	.96	54	.27
Pittsburgh, Pa.....	78	1.14	28	.41
Portland, Oreg. ¹				
Providence, R. I.....	73	2.82	54	2.06
Rochester, N. Y.....	35	1.04	56	1.66
St. Louis, Mo.....	247	2.96	44	.63
St. Paul, Minn.....	24	.85	63	2.23
San Antonio, Tex. ¹				
San Francisco, Calif.....	198	2.95	135	2.01
Seattle, Wash.....	98	2.58	166	4.37
Syracuse, N. Y.....	59	2.71	36	1.61
Toledo, Ohio.....	66	2.17	48	1.58
Washington, D. C. ¹				

¹ No report for current month.² Not reporting.³ Incomplete.⁴ Only cases of syphilis in infectious stage reported.⁵ Reported by the Jefferson Davis Hospital. Physicians are not required to report venereal diseases.

WEEKLY REPORTS FROM CITIES

City reports for week ended Oct. 10, 1936

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland.....	0		0	0	3	3	0	0	0	0	26
New Hampshire:											
Concord.....	0		0	0	1	4	0	0	0	0	0
Manchester.....	0		0	0	2	0	0	0	0	0	17
Nashua.....	1			0		0	0		0	0	
Vermont:											
Barre.....											
Burlington.....	0		0	0	0	0	0	0	0	0	8
Rutland.....	0		0	0	0	0	0	0	0	0	3
Massachusetts:											
Boston.....	0		1	7	22	23	0	7	0	69	214
Fall River.....	0		0	0	1	0	0	1	0	0	27
Springfield.....	0		0	0	3	4	0	0	1	3	33
Worcester.....	1		0	2	7	6	0	1	0	13	45
Rhode Island:											
Pawtucket.....	0		0	0	0	0	0	0	0	0	17
Providence.....	0		0	0	2	11	0	1	1	5	57
Connecticut:											
Bridgeport.....	0		0	1	1	1	0	0	0	3	31
Hartford.....	0		0	0	0	7	0	0	1	12	30
New Haven.....	0		0	1	1	1	0	0	0	3	43
New York:											
Buffalo.....	3		0	2	7	6	0	4	1	4	108
New York.....	15	6	5	21	78	46	0	82	34	85	1,393
Rochester.....	0		0	0	2	0	0	0	0	0	56
Syracuse.....	0		0	0	2	9	0	3	0	18	49
New Jersey:											
Camden.....	6		0	1	2	0	0	0	1	0	25
Newark.....	0		1	1	3	1	0	2	0	19	75
Trenton.....	0		0	0	1	1	0	1	0	0	27
Pennsylvania:											
Philadelphia.....	4		2	2	12	28	0	28	8	105	435
Pittsburgh.....	3	1	1	2	12	34	0	8	0	28	146
Reading.....	0		0	1	1	0	0	3	0	10	38
Seranton.....	1			0		0	0		0	1	
Ohio:											
Cincinnati.....	2		1	0	4	8	0	13	1	1	146
Cleveland.....	3	9	0	2	15	25	0	15	0	21	197
Columbus.....	4	1	1	0	4	12	0	1	2	18	119
Toledo.....	0		0	4	3	6	0	2	0	15	60
Indiana:											
Anderson.....	0		0	0	2	1	0	1	0	1	9
Fort Wayne.....	2		0	0	1	0	0	0	0	0	22
Indianapolis.....	3		0	0	6	11	0	0	0	0	86
Muncie.....	0		0	0	1	0	0	0	0	0	21
South Bend.....	0		0	0	1	0	0	0	0	0	14
Terre Haute.....	0		0	0	0	0	0	0	0	0	11
Illinois:											
Alton.....	0		0	0	0	2	0	0	0	0	2
Chicago.....	3	4	3	4	31	69	0	28	0	61	604
Elgin.....	0		0	0	1	0	0	0	0	1	11
Moline.....	0		0	0	1	3	0	0	0	1	8
Springfield.....	0		0	0	0	4	0	0	0	1	16
Michigan:											
Detroit.....	5	2	0	4	11	47	0	11	3	73	254
Flint.....	1		0	0	0	1	0	1	0	8	27
Grand Rapids.....	0		2	2	0	12	0	2	0	8	39
Wisconsin:											
Kenosha.....	0		0	1	0	11	0	0	0	3	10
Madison.....	0		0	0	0	0	0	0	0	2	18
Milwaukee.....	4	1	1	1	8	26	0	4	1	23	95
Racine.....	0		0	0	1	3	0	1	1	4	14
Superior.....	0		0	0	0	1	0	0	0	5	7
Minnesota:											
Duluth.....	0		0	3	0	2	0	0	0	6	23
Minneapolis.....	0		0	2	3	3	0	1	0	9	109
St. Paul.....	0		0	0	5	6	0	3	0	16	50

City reports for week ended Oct. 10, 1936—Continued

State and city	Diph- theria cases	Influenza		Mea- sles cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Iowa:											
Cedar Rapids..	0			0		1	0		0	0	
Davenport.....	0			0		1	0		0	0	
Des Moines.....	0			0		0	0		0	0	19
Sioux City.....	0			0		3	2		0	0	
Waterloo.....	2			0		0	0		0	8	
Missouri:											
Kansas City....	1		0	1	3	6	0	2	0	0	70
St. Joseph.....											
St. Louis.....	5		1	1	3	21	0	8	5	19	206
North Dakota:											
Fargo.....	0		0	0	0	3	0	0	0	0	4
Grand Forks....	0			0		2	0		0	0	
Minot.....	0		0	0	0	0	1	0	0	0	10
South Dakota:											
Aberdeen.....	0			0		0	0		0	0	
Sioux Falls....	0		0	0	0	0	0		0	0	12
Nebraska:											
Omaha.....	0		0	0	3	4	0	2	0	0	50
Kansas:											
Lawrence.....	0		0	0	0	0	0	0	0	0	0
Topeka.....											
Wichita.....	2		0	0	2	3	0	0	0	0	28
Delaware:											
Wilmington.....	1		0	4	3	0	0	2	1	4	34
Maryland:											
Baltimore.....	0	4	0	0	10	15	0	16	2	105	195
Cumberland.....	0		0	0	1	4	0	0	0	0	19
Frederick.....	0		0	0	0	0	0	0	0	0	5
District of Col.:											
Washington.....	10		0	5	11	7	0	14	2	33	173
Virginia:											
Lynchburg.....	2		0	1	1	1	0	0	0	0	19
Norfolk.....	1		0	4	5	1	0	1	0	0	31
Richmond.....	0		0	0	3	3	0	0	1	1	51
Roanoke.....	4		0	0	2	0	0	1	0	0	18
West Virginia:											
Charleston.....	1		0	0	2	1	0	1	2	0	32
Huntington.....	3		0	0	0	8	0	1	0	0	0
Wheeling.....	0		0	0	2	1	0	0	0	1	10
North Carolina:											
Gastonia.....	0			0		1	0		0	0	
Raleigh.....	0		0	0	0	0	0	0	0	0	16
Wilmington.....	3		0	0	0	2	0	1	0	0	8
Winston-Salem..	2		0	0	2	1	0	0	1	0	14
South Carolina:											
Charleston.....	1	2	0	0	0	0	0	2	0	0	18
Columbia.....											
Florence.....	0		0	0	0	0	0	0	0	0	4
Greenville.....	0		0	0	1	0	0	0	0	0	17
Georgia:											
Atlanta.....	4	7	3	0	4	7	0	3	0	1	93
Brunswick.....	1		0	0	0	0	0	0	0	0	3
Savannah.....	0	1	0	0	0	0	0	0	0	3	39
Florida:											
Miami.....	0	1	0	0	1	1	0	2	0	2	21
Tampa.....	0	1	1	0	2	1	0	1	0	0	25
Kentucky:											
Ashland.....	0			0		0	0		0	0	
Covington.....	0		0	0	0	1	0	2			13
Lexington.....	0		0	0	1	8	0	2	1	0	24
Louisville.....	4		2	0	8	1	0	0	2	13	53
Tennessee:											
Knoxville.....	3		0	1	2	4	0	2	1	0	24
Memphis.....	1		0	1	4	9	0	2	1	0	57
Nashville.....	1		1	0	3	0	0	0	0	0	56
Alabama:											
Birmingham....	2		0	0	5	2	0	6	2	0	55
Mobile.....	1		0	0	3	0	0	1	0	0	25
Montgomery....	3			0		0	0		0	0	
Arkansas:											
Fort Smith.....	1			0		3	0		0	0	
Little Rock.....	0		0	0	1	0	0	3	0	0	4
Louisiana:											
Lake Charles....	0		0	0	1	1	0	0	0	0	4
New Orleans....	4	2	1	0	9	1	0	14	0	1	162
Shreveport.....	0		0	0	5	0	0	5	0	0	36

City reports for week ended Oct. 10, 1936—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Oklahoma:											
Oklahoma City	2	21	0	0	3	2	0	0	0	0	32
Tulsa	1			0		2	0		1	0	
Texas:											
Dallas	4	1	1	0	6	2	0	3	0	2	67
Fort Worth	3		0	1	4	0	0	1	1	0	34
Galveston	1		0	0	0	0	0	0	1	0	9
Houston	6		1	0	2	2	0	4	3	3	65
San Antonio	1		2	0	2	0	0	6	0	0	62
Montana:											
Billings	0		0	0	1	0	1	0	0	0	6
Great Falls	0		0	0	1	1	1	0	0	3	7
Helena	0		0	0	0	0	0	0	0	0	6
Missoula	0		0	0	2	0	0	0	0	1	7
Idaho:											
Boise	0		1	0	0	1	0	0	0	0	6
Colorado:											
Colorado Springs	0		0	0	0	7	0	0	0	0	7
Denver	6		0	2	3	8	0	6	1	43	95
Pueblo	1		0	0	2	0	0	0	1	0	11
New Mexico:											
Albuquerque	0		0	0	2	2	0	2	2	0	23
Utah:											
Salt Lake City	0		0	2	1	6	0	2	0	7	48
Nevada:											
Reno											
Washington:											
Seattle	0		1	5	4	6	0	5	0	3	8
Spokane	0		0	0	1	11	3	0	0	0	102
Tacoma	0		0	0	1			2	1	3	22
Oregon:											
Portland	0		1	1	9	7	0	0	0	4	37
Salem	0	1		0	0	0	0	0	0	1	
California:											
Los Angeles	10	11	2	1	12	7	0	16	1	33	298
Sacramento	2	1	0	0	1	31	0	0	0	9	24
San Francisco	0		1	1	2	10	0	12	0	21	154

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
New York:				Missouri:			
New York	6	2	0	St. Louis	0	0	1
Rochester	0	0	1	Maryland:			
Syracuse	0	0	1	Baltimore	1	2	0
Pennsylvania:				District of Columbia:			
Pittsburgh	1	0	0	Washington	1	0	1
Ohio:				Tennessee:			
Cleveland	0	1	4	Knoxville	1	0	1
Columbus	0	0	2	Memphis	0	2	1
Toledo	0	0	15	Nashville	1	0	2
Indiana:				Alabama:			
Anderson	0	0	1	Birmingham	0	0	1
Indianapolis	1	0	0	Mobile	0	0	1
Illinois:				Louisiana:			
Chicago	1	1	28	Shreveport	0	1	0
Elgin	0	0	1	Colorado:			
Michigan:				Denver	0	0	1
Detroit	1	2	3	Washington:			
Grand Rapids	0	0	1	Spokane	0	0	1
Wisconsin:				Oregon:			
Milwaukee	0	0	2	Portland	1	0	0
Racine	0	0	1	California:			
Iowa:				San Francisco	0	0	1
Des Moines	0	0	1	Los Angeles	0	0	3

Epidemic encephalitis.—Cases: New York, 1.

Fellagra.—Cases: Washington, 1; Atlanta, 1; Savannah, 3; Los Angeles, 2.

Typhus fever.—Cases: New York, 1; Savannah, 6; Dallas, 2.

FOREIGN AND INSULAR

CANADA

Manitoba—Poliomyelitis.—During the week ended October 17, 1936, 10 new cases of poliomyelitis were reported in the Province of Manitoba, Canada, making a total of 355 cases. No new cases were reported in Winnipeg.

Provinces—Communicable diseases—2 weeks ended October 3, 1936.—During the 2 weeks ended October 3, 1936, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				3	1					4
Chickenpox				170	106	44	57	35	88	590
Diphtheria		10	1	55	12	7	5	1		91
Dysentery				1	2		95			98
Erysipelas				7	3		1	1	7	19
Influenza		1			21					22
Measles		2	1	70	347	55	84	61	32	652
Mumps		4			189	9	21	9	55	287
Paratyphoid fever	1				4			1		6
Pneumonia		1			13		4		8	26
Poliomyelitis				30	53	147	17		3	250
Scarlet fever		15	8	140	172	98	37	98	41	609
Trachoma									14	14
Tuberculosis	4	3	20	86	82	20	30		45	290
Typhoid fever		1	5	32	37	10	5	4	3	97
Undulant fever					1					1
Whooping cough		10	2	167	244	5	33	21	18	500

JAMAICA

Communicable diseases—4 weeks ended October 3, 1936.—During the 4 weeks ended October 3, 1936, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox		3	Puerperal septicemia		1
Dysentery	3	2	Scarlet fever	1	
Erysipelas		3	Tuberculosis	30	85
Leprosy		5	Typhoid fever	7	100

VIRGIN ISLANDS

Notifiable diseases—July–September 1936.—During the months of July, August, and September 1936, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	July	August	September	Disease	July	August	September
Dengue.....	1		2	Schistosomiasis.....	2		
Diphtheria.....		1		Sprue.....		1	
Filariasis.....		6	8	Syphilis.....	7	6	4
Gonorrhea.....	16	15	13	Trachoma.....	1		
Malaria.....		1	2	Tuberculosis.....		2	2
Measles.....	1	5	2	Typhoid fever.....	5		1
Pellagra.....	2		1	Uncinariasis.....	6	6	4

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE:

[C indicates cases; D, deaths; P, present]

Place	Week ended—											
	July 1936				August 1936				September 1936			
	4	11	18	25	1	8	15	22	29	5	12	19
Algeria:												
Bone.....												
Oran Department.....												
Philippeville.....												
Argentina.....												
Azores. (See table below.).....												
Belgian Congo.....												
Brazil. (See also table below):.....												
Santos.....												
São Paulo. ³												
British East Africa:												
Kenya.....	9	11	42	39	4	1	6	3	4	7	1	4
Tanganyika.....	5		3									
Uganda.....	62	57	153	76	25	24	22	13	17	18	17	33
Ceylon:	58	55	148	73	25	22	21	12	28	17	17	26
Anuradhapura.....	1											
Colembé.....	3	3	3	3		1	2		1	1	1	1
Plague-infected rats.....	3	3	3	3		1	2			1		
Hatton.....	3	3	8	2								
Manar.....	3	8	8									
Makiliya.....	3	1	3									
Southern Province.....												
Wellington.....												
China:												
Manchuria.....	700	604	553	363	90	70	86					
Dutch East Indies: West Java.....	689	602	550	362	86	70	86					
Ecuador:												
Alassa.....												
Dauile.....	1	1	1	1								
Guayaquil.....	1	1	1	1	2	1	1	1	1	1	1	1
Plague-infected rats.....	1			3	1	3	1	1	1	1	4	1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place	Mar. 1-28 1936	Mar. 29-Apr. 25, 1936	Apr. 26- May 30, 1936	May 31- June 27, 1936	Week ended—									
					July 1936					August 1936				
					4	11	18	25	1	8	15	22	29	September 1936 5 12 19 26
United States:														
California:														
Lassen County—Plague-infected squirrels.....				5	1									
Modoc County—Plague-infected squirrels.....				13	3	1			10					
Monterey County—Plague-infected squirrels.....				1										
Placer County—Plague-infected squirrels.....								1						
San Bernardino County—Plague-infected squirrels.....				50	5			6						
Santa Rosa—Plague-infected squirrels.....		1		P										
Ventura County—Plague-infected squirrels.....		1												
Idaho: Bonneville County—Plague-infected squirrels.....				7										
Montana: Beaverhead County—Plague-infected squirrels.....														
Nevada: Elko County—Plague-infected squirrels.....			P											
Utah:														
Beaver County—Plague-infected marmots.....					1				1	1				
Plague-infected marmots.....														
Plague-infected squirrels.....														
Garfield County—Plague-infected prairie dogs.....										2				
Sevier County—Plague-infected prairie dogs.....														
On vessels:														
S. S. <i>Ipsema</i> at Marseille from Bone and Phillip- peville.....											1			
S. S. <i>Delambre</i> at Liverpool from Montevideo, Buenos Aires, Rosario, Santos, and Las Palmas—Plague- infected rats.....														2

* Plague-infected fleas have been reported in California as follows: Week ended June 27, 1936, 3 lots in Modoc County, and 7 lots in Santa Cruz County; Aug. 19-21, 104 plague-infected fleas collected from ground squirrels in San Bernardino County. A report dated Oct. 13, 1936, states that fleas taken from ground squirrels in Monterey County and from chipmunks and ground squirrels in Placer County have been proved plague infected.

† During the week ended July 25, 1936, 153 fleas and 26 lice taken from 7 marmots (ground hogs) shot at the head of Small Horn Canyon, Beaverhead County, Mont., were reported plague infected.

‡ Plague-infected fleas in Utah have also been reported as follows: Aug. 24, 45 fleas taken from 23 prairie dogs in Garfield County, and July 28, 1936, 315 fleas taken from 11 ground squirrels in Clear Creek Canyon, Sevier County.

Place	March 1936	April 1936	May 1936	June 1936	July 1936	August 1936
Argentina:						
Salta Province.....						
San Luis Province.....						
Tucuman Province.....						
Azores.....						
Brazil (see also table above):						
Bahia State.....						
Ceara State.....						
Pernambuco State.....						
Indochina (see also table above):						
Cambodia.....						
Cochinchina.....						
Madagascar (central region).....						
Peru.....						
Libertad Department.....						
Lima Department.....						
Callao.....						
Plague-infected mts.....						
Piura Department.....						
Trujillo Department.....						
Senegal:						
Dakar ¹²						
Thies ¹²						
Tivaouane ¹³						
South-West Africa: Ovamboland.....						

¹¹ From January to August 31, 1936.

¹² Reports incomplete.

(C indicates cases; D, deaths; P, present)

[illegible]

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

[illegible]

